

APPENDIX J: SOUND LEVEL MEASUREMENT FOR DETERMINING IMPACTS ON THREATENED AND ENDANGERED SPECIES

Sound level measurements are established according to a logarithmic scale of decibels (dB). Separate measurements can be made for different sound frequency ranges, the most common being the “A-weighted” decibel scale (dBA) that approximates the way the human ear responds to noise levels. In this analysis, it is assumed that noise measured as dBA is comparable for noise effects on wildlife.

Noise descriptors commonly used in impact assessments are defined as follows:

L_{10} — the sound level exceeded 10% of the time for the period under consideration. This value is an indicator of both the magnitude (intensity) and the frequency of occurrence of the loudest noise events.

L_{eq} — the equivalent steady-state sound level that in a designated period of time (often 1 hour and expressed as $L_{eq(h)}$) would contain the same amount of sound energy as the varying levels of noise source during the same period.

L_{dn} — a 24-hour L_{eq} , with a 10 dB penalty applied to nighttime levels. This descriptor presents a day-night average noise level.

The L_{10} descriptor is easily understood. The L_{eq} descriptor is harder to understand but has advantages over L_{10} because it is more reliable for low-volume roadways, and noise levels can be added to one another for inclusion in noise analyses. The L_{eq} is typically about 3 dBA less than the L_{10} for the same conditions.

Sound levels described here in dBA are averages taken from federal guidelines for assessing noise for construction sites in developed areas; highways; and typical land uses such as residential areas, transient lodging, office buildings, retail commercial developments, livestock farming, other agriculture, and extensive natural wildlife and recreational areas. Sound levels in the parks are assumed to be equivalent to average measurements taken from guidelines.

Guidelines include the American National Standard Institute’s *Sound Level Descriptors for Determination of Compatible Land Use* (1990; ANSI, S12 1240-1990). This descriptor indicates the noise level compatible for a particular land uses such as residential single-family dwellings, transient lodging developments, and natural areas.

A second noise standard, the “Federal Interagency Guidelines for Considering Noise in Land Use Planning and Control,” was agreed to by the Department of Housing and Urban Development, the U.S. Department of Transportation, and U.S. Environmental Protection Agency, and the U.S. Department of Defense in 1980. These guidelines provide the basis for the ANSI noise guidelines.

Guidelines for assessing noise impacts due to traffic have also been established by the Federal Highway Administration and are contained in 23 CFR 772. These standards, known as Noise Abatement Criteria (NAC), identify design noise levels and relate them to various land uses or activities. NAC Category A includes areas where quiet is essential for enjoyment, such as nature sanctuaries. Category B includes noise-sensitive receptors like residences, motels, and outdoor recreation areas.

Acceptable noise levels for natural wildlife and recreational areas is 60 dBA. Construction activities typically generate noise in the range of 80-90 dBA, L_{eq} (Bolt, Beranek, and Newman. 1971). Watershed restoration uses equipment equivalent to that used in construction. Ground clearing results in about 84 dBA, L_{eq} , at 50 feet, where the noisiest piece of equipment is 50 feet from the receptor and other equipment is 200 feet from the receptor. Excavation produces a noise level of 89 dBA, L_{eq} , at 50 feet. To reduce the noise levels from these two operations to 60 dBA, one must be 790 and 1400 feet, respectively, from the source.